**Problem:** When making a rollercoaster from hot wheels track, what is the best position to prevent the car from falling off? In other words, in order to make the ride efficient and safe for all passengers.

**Hypothesis:** If the coaster is stable and the car is at the correct height, then the car will make it to the end safely.

**Procedure:**

**Materials:**

* Hot wheel track in various lengths
* Car
* Stand
* Tape
* Books
* Chair
* Lab Table

**Steps:**

* Collect all materials listed above
* Attach a black loop to the tall steel pole using tape
* Add a piece of track to that mechanism to form a ramp
* Using a large piece of track, make a large loop, using connectors
* Add a piece of track to that to connect the large loop with a small loop
* To make the small loop use a small piece of track using connectors
* Add a piece of track to that to connect the small loop with a up and over hill
* To make the up and over take two small red ramp pieces and put them under a long piece of track. This being the end of the roller coaster.

**Variables:**

* The variable that you can manipulate is the height of where the car is released from.
* The variable that responded being the cars completion of the track.
* The variable we controlled was the car that we picked, the tracks height, and the overall model of the coaster was standard for everyone.

**Data:**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | H1 | H2 | H3 | H4 | H5 | H6 | H7 |
| Length from floor to bottom of piece (m) | 1.2 m | 0.83 m | 0.7 m | 0.51 m | 0.33 m | 0.23 m | 0.09 m |
| Length from floor to top of piece (m) | 1.9 m | 1.28 m | 0.7 m | 0.68 m | 0.33 m | 0 m | 0 m |

**Data Analysis:** Attached.

**Conclusion:** The hypothesis stated that if the coaster is stable and the car is at the correct height, then the car will make it to the end safely. This is correct because after 1,000 trial runs we finally achieved stability in our coaster (using books and chairs) and learned to drop it from a constant height (marked with tape). The main error in this lab was misunderstanding why the car would crash instead of glide smoothly. Improvements could be made in the maintenance of the ride. In the real world, making a roller coaster must be quite difficult. We only experimented with the damage of a hot wheel, whereas they can’t afford to experiment with human lives.